Claims:

1. An apparatus for electrostatically applying a powder material to substrates, the apparatus comprising:

a plurality of platens arranged to move along an endless path, each platen being arranged to hold a plurality of substrates;

driving means for driving the platens along the endless path; and

an applicator assembly for applying the powder material to the substrates, the applicator assembly being located on a part of the endless path.

2. An apparatus according to claim 1 wherein the applicator assembly comprises at least one applicator having a supply of powder material and charging means for electrostatically charging the powder material.

3. An apparatus according to claim 2 wherein a portion of the applicator is replaceable by a user, the replaceable portion including the supply of powder material.

4. An apparatus according to any one of the preceding claims further including a fusing assembly for fusing powder material electrostatically applied to the substrates, the fusing assembly being located on a part of the endless path.

5. An apparatus according to claim 4 wherein the fusing assembly comprises a plurality of fusing devices disposed in series along the endless path.

6. An apparatus according to any one of the preceding claims further including a loading station for loading substrates onto the platens.

7. An apparatus according to any one of the preceding claims further including an unloading station for removing substrates from the platens.

8. An apparatus according to any one of the preceding claims further including a transfer station for transferring the substrates between platens.

9. An apparatus according to any one of the preceding claims further including at least one detector for inspecting the platens.

10. An apparatus according to claim 9 wherein the at least one detector comprises a plurality of optic fibres.

11. An apparatus according to claim 9 wherein the at least one detector comprises a camera.

12. An apparatus according to any one of claims 9 to 11 wherein the detector is remotely operable.

13. An apparatus according to any one of the preceding claims wherein the driving means is arranged to drive the platens along the endless path at a plurality of speeds.

14. An apparatus according to any one of the preceding claims wherein each of said platens is independently drivable by said driving means.

15. An apparatus according to any one of the preceding claims further including a remote controller arranged to control the motion of the said platens.

16. An apparatus according to claim 15 wherein said remote controller communicates with at least some of said platens via a wireless link.

17. An apparatus according to any one of the preceding claims wherein the endless path is substantially horizontal.

18. An apparatus according to claim 17 further including a vertical partition separating the driving means from the platens, the driving means being located in a non-product region and the platens being located in a product region.

19. An apparatus according to claim 18 further including a second vertical partition separating the non-product region from the product region, the first and second vertical partitions defining a substantially annular chamber between the non-product region and the product region.

20. An apparatus according to claim 19 wherein the substantially annular chamber includes an air flow in the vertical direction.

21. An apparatus according to any one of claims 17 to 20 wherein the platens are arranged to move along the endless path in pairs, one of the platens in the pair being located above the other platen in the pair.

22. An apparatus according to claim 21 wherein the platens in each pair are movable with respect to one another in the vertical direction.

23. An apparatus according to claim 21 or claim 22 wherein the applicator assembly for applying the powder material to the substrates comprises at least one upper applicator for applying the powder material to substrates in the upper platen and at least one lower applicator for applying the powder material to substrates in the lower platen.

24. An apparatus according to claim 23 wherein the upper and lower applicators are arranged to supply powder material to the substrates substantially simultaneously.

25. An apparatus according to claim 23 wherein the upper and lower applicators are arranged to supply powder material to the substrates sequentially.

26. An apparatus according to any one of claims 21 to 25 further including a fusing assembly comprising an upper fuser for fusing powder material electrostatically applied to the substrates in the upper platen and a lower fuser for fusing powder material electrostatically applied to the substrates in the lower platen.

27. An apparatus according to claim 26 wherein the upper and lower fusers are arranged to fuse powder material on the substrates substantially simultaneously.

28. An apparatus according to any one of claims 21 to 27 further including a transfer station for transferring substrates from the upper platen to the lower platen.

29. An apparatus according to claim 28 wherein the transfer station is arranged to move the platens relative to one another in the vertical direction such that a face of the lower platen is adjacent a face of the upper platen, the face of the upper platen holding a plurality of substrates, to shift the plurality of substrates from the face of the upper platen to the adjacent face of the lower platen and to separate the adjacent faces of the upper and lower platens.

30. An apparatus according to claim 28 or claim 29 wherein the transfer station includes at least one vibrator for vibrating one or both platens.

31. An apparatus according to any one of claims 21 to 30 wherein powder is applied to a first portion of said substrates when said substrates are in the upper platen and wherein powder is applied to a second portion of said substrates when said substrates are in the lower platen, said second portion being on the opposite side of said substrates to said first portion.

32. An apparatus according to any preceding claim wherein said plurality of platens are fixed to move along the endless path.

33. A method for electrostatically applying a powder material to substrates, the method comprising the steps of:

providing a plurality of platens arranged to move along an endless path, each platen being arranged to hold a plurality of substrates;

placing the substrates on the platens;

driving the platens in series along an endless path; and

electrostatically applying a powder material to the substrates on the platens.

34. A method according to claim 33 wherein the step of electrostatically applying a powder material comprises driving the platens past at least one applicator having a supply of powder and charging means for electrostatically charging the powder material.

35. A method according to claim 33 or claim 34 further comprising the step of fusing the powder material after it is electrostatically applied.

36. A method according to claim 35 wherein the step of fusing comprises driving the platens past a plurality of fusing devices disposed in series along the endless path.

37. A method according to any one of claims 33 to 36 further comprising the step of removing the substrates from the platens after the powder material has been electrostatically applied.

38. A method according to any one of claims 33 to 37 wherein the platens are arranged to move along the endless path in pairs, one of the platens in the pair being located above the other platen in the pair.

39. A method according to claim 38 further comprising the step of transferring the substrates from the upper platen to the lower platen.

40. A method according to claim 39 wherein the step of transferring the substrates between platens comprises vibrating one or both platens.

41. A method according to any one of claims 33 to 40 further comprising the step of inspecting the substrates in the platens.

42. A method according to claim 41 wherein the substrates are inspected using one or more cameras.

43. A method according to any one of claims 33 to 42 wherein the step of driving the platens along the endless path comprises driving the platens simultaneously at a plurality of speeds.

44. A method according to any one of claims 33 to 43 wherein each of said platens is independently drivable by said driving means.

45. A method according to any one of claims 33 to 44 wherein the motion of each of said platens is controlled by a remote controller.

46. A method according to claim 45 wherein said remote controller communicates with at least some of said platens via a wireless link.

47. A method according to any one of claims 33 to 46 wherein the endless path along which the platens are driven is substantially horizontal.

48. A method according to any one of claims 33 to 47 wherein the substrates are pharmaceutical substrates.

49. A method according to any one of claims 33 to 48 wherein the substrates are solid dosage forms.

50. A method according to any one of claims 33 to 49 wherein the substrates are cores of pharmaceutical tablets.

51. An apparatus according to any one of claims 1 to 32 for carrying out the method of any one of claims 33 to 50.

52. An apparatus substantially as hereinbefore described and as illustrated by the accompanying drawings.

53. A method of electrostatically applying a powder material to opposite faces of each of a plurality of substrates, the method comprising the steps of:

providing an upper platen and a lower platen, the upper platen being located vertically above the lower platen, each platen being arranged to hold a plurality of substrates;

providing a plurality of substrates on the upper face of the upper platen;

electrostatically applying powder material to exposed first faces of each of the plurality of substrates on the upper platen;

rotating the upper platen so that the plurality of substrates is located on the lower face of the upper platen;

moving the platens relative to one another in the vertical direction such that the upper face of the lower platen is adjacent the lower face of the upper platen;

shifting the plurality of substrates from the lower face of the upper platen to the upper face of the lower platen;

separating the adjacent faces of the upper and lower platens; and

electrostatically applying powder material to exposed second faces of each of the plurality of substrates on the lower platen.

54. A method according to claim 53 wherein the step of shifting the plurality of substrates from the lower face of the upper platen to the upper face of the lower platen includes vibrating one or both platens.

55. An apparatus for electrostatically applying a powder material to substrates, the apparatus comprising:

a plurality of pairs of platens arranged for movement about an endless horizontal path, each pair of platens comprising a lower platen and an upper platen located vertically above the lower platen, each platen being arranged to hold a plurality of substrates;

an applicator assembly for applying the powder material to the substrates, the applicator assembly being located on a part of the endless path; and

a transfer station for moving the platens relative to one another in the vertical direction such that the upper face of the lower platen is adjacent the lower face of the upper platen, the lower face of the upper platen holding a plurality of substrates, for shifting the plurality of substrates from the lower face of the upper platen to the upper face of the lower platen and for separating the adjacent faces of the upper and lower platens.

56. An apparatus according to claim 55 wherein the transfer station comprises a vibrator for vibrating the upper and/or lower platens.

57. An apparatus according to claim 55 or claim 56 wherein the applicator assembly comprises at least one upper applicator for applying the powder material to substrates in the upper platen and at least one lower applicator for applying the powder material to substrates in the lower platen.

58. An apparatus as claimed in any one of claims 55 to 58 further including a kinematic mounting arrangement between the upper and lower platens to accurately control the position of the upper and lower platens relative to one

another when the plurality of substrates are shifted from the lower face of the upper platen to the upper face of the lower platen.

59. An apparatus for electrostatically applying a powder material to substrates, the apparatus comprising:

a plurality of platens arranged to move along an endless path, each platen being arranged to hold a plurality of substrates;

an applicator assembly located on a part of the endless path for applying the powder material to substrates; and

driving means for driving the platens along the endless path, the driving means being arranged to drive platens simultaneously at a variety of speeds.

60. An apparatus according to claim 59 wherein each of said platens is independently drivable by said driving means.

61. An apparatus according to claim 59 or claim 60 further including a remote controller arranged to control the motion of the said platens.

62. An apparatus according to claim 61 wherein said remote controller communicates with at least some of said platens via a wireless link.

63. A method for electrostatically applying a powder material to substrates, the method comprising the steps of:

providing a plurality of platens arranged to move along an endless path, each platen being arranged to hold a plurality of substrates;

placing the substrates on the platens;

driving the platens in series along an endless path, each platen being independently driveable at a variety of speeds; and

electrostatically applying the powder material to the substrates on the platens.

64. A method according to claim 63 wherein each of said platens is independently drivable by said driving means.

65. A method according to claim 63 or claim 64 wherein the motion of each of said platens is controlled by a remote controller.

66. A method according to claim 65 wherein said remote controller communicates with at least some of said platens via a wireless link.

67. An apparatus for electrostatically applying a powder material to substrates, the apparatus comprising:

a plurality of platens arranged to move along an endless path, each platen being arranged to hold a plurality of substrates;

an applicator assembly located on a part of the endless path for applying the powder material to substrates; and

driving means for driving the platens along the endless path, wherein each of said platens is independently drivable by said driving means.

68. An apparatus according to claim 67 further including a remote controller arranged to control the motion of the said platens.

69. An apparatus according to claim 68 wherein said remote controller communicates with at least some of said platens via a wireless link.

70. A method for electrostatically applying a powder material to substrates, the method comprising the steps of:

providing a plurality of platens arranged to move along an endless path, each platen being arranged to hold a plurality of substrates;

placing the substrates on the platens;

driving the platens in series along an endless path, each platen being independently driveable by said driving means; and

electrostatically applying the powder material to the substrates on the platens.

71. A method according to claim 70 wherein the motion of each of said platens is controlled by a remote controller.

72. A method according to claim 71 wherein said remote controller communicates with at least some of said platens via a wireless link.

73. A carriage for conveying substrates along a path, the carriage comprising:

an upper platen for holding a plurality of substrates;

a lower platen for holding a plurality of substrates;

a bracket for supporting the upper and lower platen, the upper and lower platen being rotatably mounted on the bracket and being movable vertically with respect to one another; and

driving means for driving the carriage along the path.

74. A carriage according to claim 73 wherein, when the substrates are conveyed along the path by the carriage, the vertical separation of the upper platen and the lower platen is substantially preselected by a user, but the upper platen and/or the lower platen are free to move a small amount in the vertical direction.

75. A carriage according to claim 73 or claim 74 further including a kinematic mounting arrangement between the upper and lower platens, such that, on moving the upper and lower platens so that they are adjacent to one another, the relative positions of the upper and lower platens are accurately controllable.

76. An apparatus for electrostatically applying a powder material to substrates, the apparatus comprising:

a product region comprising a plurality of platens arranged to move along an endless path, each platen being arranged to hold a plurality of substrates and an applicator assembly located on a part of the endless path for applying the powder material to substrates;

a non-product region comprising driving means for driving the platens along the endless path; and

a partition separating the product region and the non-product region.

77. An apparatus according to claim 76 further comprising a second partition separating the product region and the non-product region, the two partitions defining an insulating chamber.

78. An apparatus according to claim 77 wherein the insulating chamber includes an air flow in a direction substantially parallel to the partitions.

79. An apparatus according to any one of claims 76 to 78 wherein the endless path is substantially horizontal and the partition or partitions is/are substantially vertical.

80. A platen arranged to hold a plurality of substrates, the platen comprising:

a vacuum chamber for connection of the platen to a vacuum source;

an electrically conducting substrate mount having a plurality of hollows each suitable for receiving one of said plurality of substrates, wherein said substrate mount has a plurality of passageways therethrough, each passageway connecting one of said plurality of hollows to said vacuum chamber;

an electrically conducting shield having a plurality of holes aligned with the hollows in said substrate mount; and

an electrical insulator, positioned to electrically insulate said shield from said substrate mount, wherein, in the use of the platen, said electrical insulator electrically insulates said shield from said plurality of substrates.

81. A platen as claimed in claim 80 further including a tool plate located between said vacuum chamber and said substrate mount, said tool plate having a plurality of passageways therethrough aligned with the passageways of said substrate mount.

82. A platen as claimed in claim 80 or claim 81 further including a filter mount interposed between the platen and the vacuum source.

83. A platen as claimed in any one of claims 80 to 82 wherein, in use, the platen is connected to the vacuum source via a carriage arm having a vacuum pipe therein.